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[54]	ELECTROCHEMICAL BIOSENSOR TEST
	STRIP

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References Cited

U.S. PATENT DOCUMENTS

4.224.125 9/1980 Nakamura et al. . 4,254,083 3/1981 Columbus.

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

0 010 456 B1	4/1980	European Pat. Off
0 080 304 A1	6/1983	European Pat. Off
0 127 958 B1	12/1984	European Pat. Off
0 136 362 B1	4/1985	European Pat. Off
0 170 375 A2	2/1986	European Pat. Off
0 206 218 A2	12/1986	European Pat. Off
0 230 472 A1	8/1987	European Pat. Off
0 359 831 A1	3/1990	European Pat. Off
0 400 918 A1	12/1990	European Pat. Off
0 537 761 A2	4/1993	European Pat. Off
0 732 406 A1	9/1996	European Pat. Off.

60-173457 9/1985 Japan . 60-173458 9/1985 Japan . 60-173459 9/1985 Japan .

(List continued on next page.)

OTHER PUBLICATIONS

Williams et al., "Electrochemical-Enzymatic Analysis of Blood Glucose and Lactate," Analytical Chemistry, Mon-santo Company (Everett, Massachusetts), vol. 42 (No. 1), pp. 118-121 (Jan. 1970).

Jonathan Lee Talbott, "Enzymatic Amperometry of Glucose," a Ph.D. Dissertation for The Pennsylvania State University, The Graduate School, Department of Chemistry (Jan. 1988).

Nankai et al., "disposable Glucose Sensor Using Hexacyanoferrate(III) As A Mediator," Japanese Sensor Newsletter, Edison Sensor Technology Center, Case Western Reverse University (Cleveland, Ohio), vol. 3 (No. 1), pp. 16-20 (Mar. 1989).

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ABSTRACT

An electrochemical biosensor test strip with four new features. The test strip includes an indentation for tactile feel as to the location of the strips sample application port. The sample application port leads to a capillary test chamber, which includes a test reagent. The wet reagent includes from about 0.2% by weight to about 2% by weight polyethylene oxide from about 100 kilodaltons to about 900 kilodaltons mean molecular weight, which makes the dried reagent more hydrophilic and sturdier to strip processing steps, such as mechanical punching, and to mechanical manipulation by the test strip user. The roof of the capillary test chamber includes a transparent or translucent window which operates as a "fill to here" line, thereby identifying when enough test sample (a liquid sample, such as blood) has been added to the test chamber to accurately perform a test. The test strip may further include a notch located at the sample application port. The notch reduces a phenomenon called "dose hesitation".

32 Claims, 5 Drawing Sheets

